

SECTION 2.3.4

TEN MILE RIVER WATERSHED

Based on the recognition that the anadromous fishery is in decline, activities to assess the watershed and improve conditions for anadromous salmonids are underway. The Ten Mile River watershed harbors the last native coho salmon in Mendocino County. As such, protection of the fish and restoration of their habitat in the Ten Mile River watershed is of special interest. A Clean Water Act section 303(d) TMDL waste reduction strategy for sediment has been completed and approved by USEPA in 2000. The following provides an overview of activities and outlines the basic framework and strategy at this time.

WATERSHED DESCRIPTION

The Ten Mile River watershed drains an area of approximately 31,000 hectares or 120 mi². It is located north of the City of Fort Bragg by eight miles, sharing ridges with Pudding Creek and the North Fork of the Noyo River to the south and Wages Creek and the South Fork of the Eel River to the north. Elevations range between sea level and 977 meters (3,205 feet). The Ten Mile River watershed experiences a Mediterranean-type climate typified by abundant rainfall and cool temperatures during the winter and dry, hot summers punctuated with cool breezes and fog along the coast. Precipitation occurs primarily as rain with 40 inches in the western portion and 70 inches in the eastern portion of the watershed. Approximately 90% of the annual precipitation occurs between October and April.

The watershed is entirely privately owned, with Hawthorne Timber Company, LLC (managed by Campbell Timberland Management, LLC), the successor to Georgia-Pacific West, owning about 85 percent of the watershed. Three small non-industrial timber owners and a handful of other residences are in the watershed. The terrain varies from the flat estuary and broad river floodplain to rugged mountainous topography with high relief. The Ten Mile River has three main forks: the North Fork, Middle Fork (also known as the Clark Fork) and the South Fork. Most of the basin, aside from the northeast grasslands, is characterized by steep, narrow drainages bordered by steep to moderately steep slopes leading to the headwaters of the tributaries.

The Ten Mile River watershed has a dominant overstory consisting of Redwood and Douglas fir. Redwood is the dominant constituent of coastal forest stands while Douglas fir dominates the more inland sites. Minor conifer components in the area include Grand Fir and Western Hemlock. Hardwood species such as Tanoak and Pacific Madrone are other common components of conifer stands, though only on xeric sites. Generally, Tanoak and Pacific Madrone constitute a higher percentage of the stands in the inland portions of the watershed. Interior Live Oak is a minor component at most xeric sites on inland ridges. Further inland, near the headwaters of the North Fork and Clark Fork, open grassland dominates with an overstory of California Black Oak and Oregon White Oak punctuated with Douglas-fir/Redwood/Tan Oak stand.

Rocks of the Franciscan Complex, primarily the relatively coherent and stable Coastal Belt Terrain, dominate the bedrock geology of the watershed. These rocks are overlain by a variety of surficial deposits, varying locally from beach sand, marine terrace deposits, dune sands, estuary deposits, landslide debris, alluvium, and soil and colluvium.

The history of the Ten Mile River watershed is largely defined by timber harvest, which began in the lower basin about 1870. The railroads were developed in the 1910's and used for timber yarding and hauling. Tractor yarding began in the 1930's and major portions of the watershed were harvested for

timber from the 1940's to the 1960's. The forest was left to regenerate until the 1980's when timber harvest was again increased. Coho and chinook salmon have declined sharply in the Ten Mile River watershed. Steelhead trout, however, may be now surpassing the population numbers identified in the 1960s. The Ten Mile River watershed harbors the last native coho salmon in Mendocino County (last count indicates less than 200 individual fish). The population of coho in the 1960's was about 6,000. As such, protection of the fish and restoration of their habitat in the Ten Mile River watershed is of special interest. Chinook salmon are not considered to be native to the Ten Mile River, although chinook have been reported caught in the River "several decades ago."

The primary beneficial use of concern in the Ten Mile River watershed is the cold freshwater fishery which supports coho salmon (*Oncorhynchus kisutch*), steelhead trout (*Oncorhynchus mykiss*), and chinook salmon (*Oncorhynchus tshawytscha*). The Ten Mile River watershed also supports other native and introduced fish and aquatic species including: three-spined stickleback, coast range sculpin, prickly sculpin, several species of lamprey, pacific giant salamander, several species of newt, yellow-legged frog, and tailed frog. The beneficial uses of water related to rare, threatened or endangered species has been proposed for this basin. As with many of the north coast watersheds, the cold water fishery appears to be the most sensitive of the beneficial uses in the watershed because of the sensitivity of salmonid species to habitat changes and water quality degradation. Accordingly, protection of these beneficial uses is presumed to protect any of the other beneficial uses that might also be harmed by impaired water quality.

Additional beneficial uses related to the Ten Mile River watershed's cold water fishery are:

- Commercial and sport fishing (COMM)
- Cold freshwater habitat (COLD)
- Migration of aquatic organisms (MIGR)
- Spawning, reproduction, and early development (SPWN); and
- Estuarine habitat (EST)

There are two permits for gravel mining currently in effect in the Ten Mile River watershed. These are issued to Watkins Sand & Gravel for the removal of up to 2,500 cubic yards of gravel per year from several sites in the South Fork of the Ten Mile River channel and up to 10,000 cubic yards from a hillside quarry, and to Baxman Gravel Company for the removal of up to 50,000 cubic yards of rock per year from a hillside quarry. There have been other gravel mining operations in the Ten Mile River watershed prior to those associated with these two permits. However, previous operations were not permitted. Although gravel mining is a land use activity in the basin, it does not appear to have contributed significantly to the sediment problems.

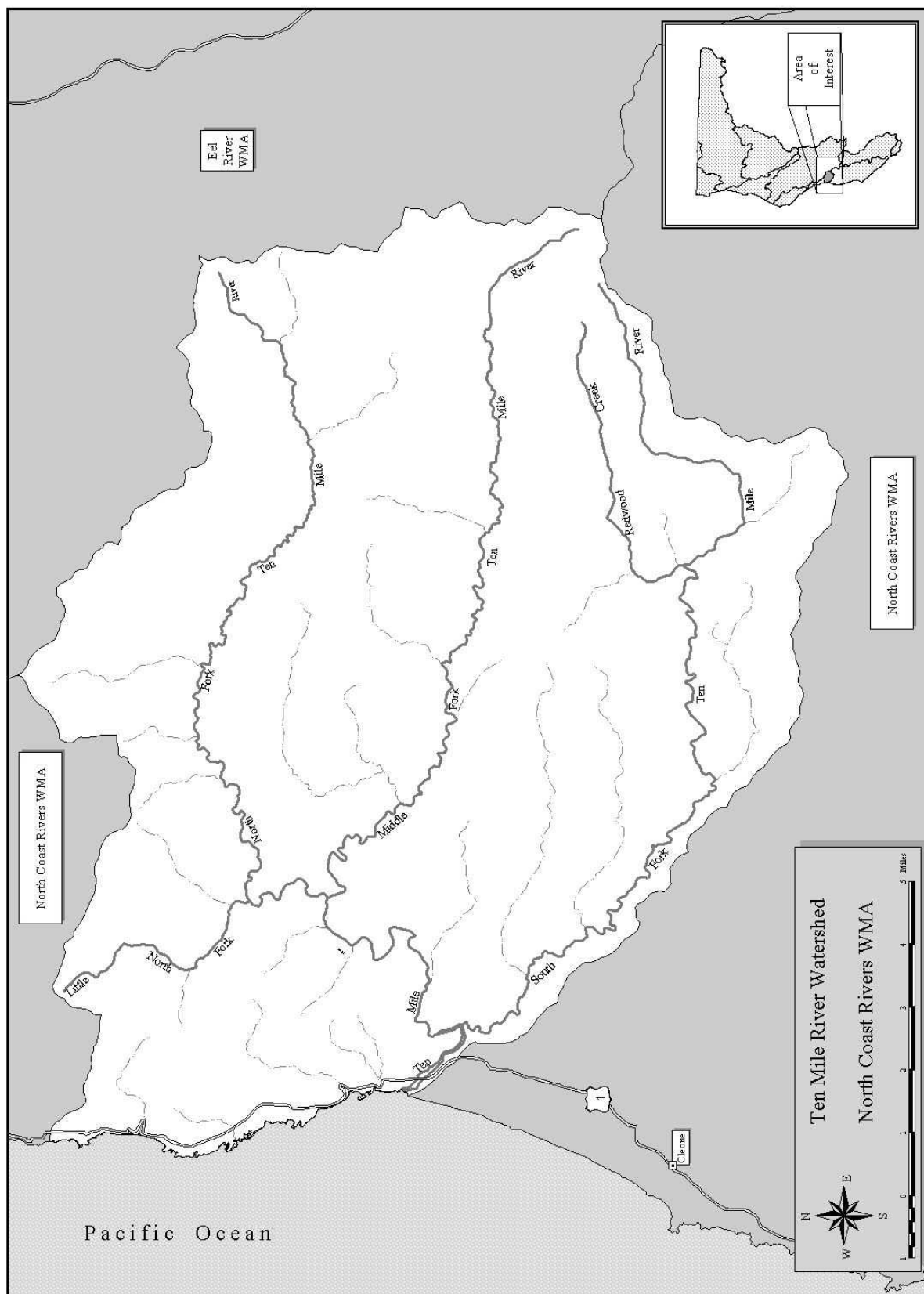


Figure 2.3.4.1. Ten Mile River Watershed

IMPLEMENTATION STRATEGY

Strategy development will occur in the form of the TMDL waste load reduction strategy for sedimentation. The TMDL is tied to resource impacts and reduction of sources to reduce impacts and bring the watershed into a desired future condition that is consistent with the enhancement and maintenance of salmonid species. A broad interagency effort was used to gather and assess existing information on the watershed. Likewise, the development of the strategy incorporated significant interagency and public coordination.

Other concerns in the watershed will continue to be addressed through existing programs. However, vineyards are rapidly expanding in the north coast region. Much of this expansion is occurring on hillsides where there is increased erosion potential and delivery of sediment to nearby streams. Outreach is being conducted by Regional Board staff to educate vineyard landowners of best management practices for prevention of increased sedimentation of waters of the State and protection of the beneficial uses of water. Current funding constraints will limit Regional Board staff outreach activities and enforcement activities to address this issue.

Given current funding constraints, any new and/or redirected resources should be focused on staffing for field nonpoint source compliance and enforcement inspections and hillside vineyard erosion issues as they develop

Institutional framework

The *Water Quality Control Plan for the North Coast Region* (Basin Plan) contains specific water quality objectives and implementation programs to protect and enhance identified beneficial uses of water. The over-arching regulatory provisions of the Basin Plan are the Action Plan for Logging, Construction and Associated Activities and the Nonpoint Source Action Plan. The SWRCB and CDF/BOF entered into a Management Agency Agreement, which delegates primary water quality authority to the CDF/BOF associated with timber harvest regulation. The Regional Water Board has not given up any authority to regulate timber if violations of the Basin Plan occur or threaten to occur. Regulatory activities associated with timber harvest are conducted in accordance with that agreement.

ASSESSMENT AND PROBLEM IDENTIFICATION

Several management-related factors have contributed to the elevated sediment delivery rates throughout the watershed. The most important include high rates of timber harvest and associated road building, both historically and currently; high road densities; and, historically, high densities of skid trails. While overall rates have declined in the period from 1933 – 1999, sediment generation from road surface erosion has increased. Current sediment delivery from all sources is estimated at 629 tons/sq. mile/ year, with about 50 percent of that background and rest management related. There are currently 940 miles of roads in the Ten Mile watershed, which translates to a basinwide road density of 7.86 miles/sq. mile (including the former railroads that were converted to roads).

While some sediment load in the stream is natural, much of the excess sediment is directly and indirectly caused by land management activities. For example, timber harvest activities can result in excess sediment loads in the stream as a result of road construction and use (sediment discharged into the basin from road crossings failures, surface erosion and deposition, and landsliding associated with road location and construction), as well as the actual harvesting of timber (which causes ground disturbance and surface erosion or could trigger landslides and other ground failures that deliver directly to the stream).

The existing data indicate that coho salmon continue to spawn and rear with some regularity in the Little North Fork Ten Mile River, Clark Fork Ten Mile River, Bear Haven Creek, South Fork Ten Mile River, Smith Creek, Campbell Creek, and Churchman Creek. For the most part, these streams

have at least some habitat characteristics that favor salmonids – some C-type channel, good scour pool frequency, LWD-formed habitat, and suitable summer stream temperatures. Coho salmon habitat in the Ten Mile River watershed could be significantly improved with reductions in sediment delivery, protection and improvement in riparian functions, increases in large woody debris for sediment metering and habitat, and modification of stream channel type. Coho salmon may currently comprise only about 2% of the salmonid population in the Ten Mile River watershed.

In the 1960s, the Ten Mile River was estimated to have a total steelhead trout population of 9,000 fish. More recent data, including electrofishing, outmigrant, and spawning surveys indicate fairly stable populations of steelhead distributed throughout the Ten Mile River watershed. An estimated 905,169 steelhead trout have occupied the basin from 1993 to 1997. This is 100 times greater than the 9,000 steelhead trout estimated to occupy the basin in the 1960s.

It is reported that chinook have been introduced to the Ten Mile River in the 1980s, with the last and largest release in 1987 (9,000 fingerlings released). Chinook carcasses found in the watershed are composed of various age groups and may indicate a rare successful introduction. Less than ten fish were found in the watershed in 1995-96. Though few, chinook are found widely scattered throughout the Ten Mile River watershed, including: Little North Fork Ten Mile River, North Fork Ten Mile River, Clark Fork Ten Mile River, and South Fork Ten Mile River. Unfortunately, very limited data regarding chinook salmon has been collected over the years.

Less than 14 percent fine sediment (< 0.85 mm) in a stream is good for salmonid spawning and rearing. Locations with fine sediment falling within the range of 14 to 20% are therefore judged to be less than ideal with respect to sediment composition; but, they may nonetheless allow for at least minimal salmonid spawning, incubation and emergence success. Using these criteria, it appears that each of the three main forks of the Ten Mile River watershed, on average, only minimally support salmonid spawning, incubation, and emergence success. The subwatersheds of the Clark and South Forks of the Ten Mile River are essentially identical in the percentage of substrate that is composed of fine sediment (< 0.85 mm). The North Fork Ten Mile River subwatershed appears slightly more rich in fine sediment (< 0.85 mm) than the other two. Data developed for the Ten Mile River watershed indicates an average annual sediment discharge of 1,135 ton/mile/year for the period 1952 to 1997.

A maximum weekly average temperature (calculated as the mean of daily maximums) of 16.8°C predicts whether or not coho will be present in a stream. The Little North Fork Ten Mile River, the Middle and Upper Clark Fork Ten Mile, Smith, Mill, Churchman and Redwood Creeks and Upper South Fork Ten Mile River all exhibit temperatures adequate for salmonid survival. All other sampling locations exhibit temperatures that are inadequate to support coho summer rearing.

The existing data indicate that coho salmon continue to spawn and rear with some regularity in the Little North Fork Ten Mile River, Clark Fork Ten Mile River, Bear Haven Creek, South Fork Ten Mile River, Smith Creek, Campbell Creek, and Churchman Creek. For the most part, these streams have at least some C-type channel; scour pool frequency of at least 17% (by length), LWD-formed habitat frequency of at least 11% (by length), and weekly average summer stream temperatures no more than 16.8°C .

Summary of findings on salmonid habitat:

- Shelter is extremely poor throughout the watershed, including large woody debris.
- Stream temperatures are elevated in the three main forks. Temperatures are also elevated in Campbell Creek and Redwood Creek. At these locations, more than 16% of the stream side canopy is open.

- The percentage of habitat in scour pools is extremely poor in all but the main forks and Little North Fork Ten Mile River, Bear Haven Creek, Smith Creek and Campbell Creek.
- The percentage of habitat formed by large woody debris is extremely poor in all but Little North Fork Ten Mile River, Bear Haven Creek, Smith Creek and Campbell Creek.
- The availability of C-type channel is limited to Little North Fork Ten Mile River, Bear Haven Creek, Little Bear Haven Creek, South Fork Ten Mile River, Smith Creek, and Campbell Creek.

Coho salmon habitat (and therefore other salmonid habitat) in the Ten Mile River watershed could be significantly improved with reductions in sediment delivery, protection and improvement in riparian functions, increases in large woody debris for sediment metering and habitat, and modification of stream channel type.

WATER QUALITY GOALS AND ACTIONS

GOAL 1: Protect surface and ground water MUN, DOM, REC-1, and REC-2 uses

GOAL 2: Protect and enhance beneficial uses associated with anadromous fishes COLD, MIGR, SPWN, EST, COMM

SUMMARY OF WATERSHED ACTIVITIES

The overall emphasis in the watershed is the completion of the TMDL waste reduction strategy for sediment. Increased assessment activities and continued high priority forestry related activities, including any needed outreach to new vineyards, are commensurate with that charge.

Assessment and Monitoring:

Assessment of existing information was used in the development of the TMDL strategy, drawing from existing information contained in plans being developed by the CDF and private timber companies as well as any citizen information that is made available.

Monitoring in the long term will be associated with determining the effectiveness of management practices to reduce erosion and sedimentation and determining trends towards the desired future condition.

Education and Outreach:

The TMDL process will enhance public and agency participation. Our intent is to improve the recognition of land use impacts on the aquatic environment from nonpoint sources and to foster adaptive management for overall watershed health.

Coordination:

We currently coordinate with local and State agencies on an as-needed basis. Improved coordination is sought as part of the TMDL implementation process and the North Coast Watershed Assessment.

Core Regulatory:

The current level of point source regulation (inspection, monitoring, and enforcement) on traditional dischargers with some increase in storm water issues is anticipated. Individual waste disposal systems as well as construction related problems, are addressed through the core regulatory program and the local oversight of individual systems.

Ground water:

Ground water issues center around petroleum contamination and mill sites and will continue to receive the current level of activity. Groundwater and surface water contamination is suspected at former and existing mill sites that historically used wood treatment chemicals. Discharges of

pentachlorophenol, polychlorodibenzodioxins, and polychlorodibenzofurans likely occurred with poor containment typically used in historical wood treatment applications. These discharges persist in the environment and accumulate in surface water sediments and the food chain. Additional investigation, sampling and monitoring, and enforcement actions are warranted, but insufficient resources exist to address this historical toxic chemical problem.

Nonpoint Source:

Continued involvement in forestry, grazing and county road issues is necessary to ensure protection of aquatic resources. The recent listing of coho salmon as threatened under the federal Endangered Species Act has put the spotlight on all land use activities that potentially may increase sedimentation or otherwise affect habitat. The TMDL implementation process will increase work with local agencies and groups regarding land use effects on water quality, following the State Nonpoint Source Management Plan strategy of first emphasizing voluntary implementation of controls to reduce nonpoint source pollution. An outreach program will enhance the effectiveness of the program. Where land management activities are found to be out of compliance with Basin Plan standards, Regional Water Board staff investigation and enforcement actions may be determined necessary.

Timber Harvest:

We have an extensive Timber Harvest program where staff review and inspect timber harvest plans for implementation of the Forest Practice Rules and best management practices to ensure protection of water quality and beneficial uses. We are expanding our program activities on private land in concert with California Department of Forestry and Fire Protection.

Local Contracts:

We will continue active involvement in the Clean Water Act sections 319(h) and 205(j) grant programs and the Water Bond (Proposition 13) grant program, as well as promoting other programs like the California Department of Fish and Game programs.

Water Quality Planning:

The Basin Plan review process feeds into the activities to the extent issues were identified in the Triennial Review and applicable to the Ten Mile River watershed. The top priority issue is review of the Nonpoint Source Control Measures.

Additionally, the TMDL strategy will be incorporated into the Basin Plan at some future date.

Evaluation and feedback

We will evaluate progress on a yearly basis, the TMDL providing the focus.

The Regional Water Board will coordinate with landowners to develop a monitoring plan that includes road and hillslope indicators that directly relate to sediment delivery to the watercourse. Substrate composition and V* are relatively simple to monitor, and should be monitored regularly. Thalweg profiles are better monitored on an infrequent basis, potentially after large flood events.

Resource Needs

The habitat inventories available for the Ten Mile River watershed provide useful information about habitat conditions. The fish population data, temperature data, and substrate composition data are especially useful for understanding conditions and trends in the basin. The availability of each of these data sets in electronic form for each of the years in which they were collected would vastly improve the ability of Regional Water Board staff to analyze it. Some additional parameters that would help better understand changes in sedimentation in the basin, include:

- Longitudinal profiles

- Cross-sections
- V*
- LWD volume and distribution

Continued and improved spawning, rearing, and outmigrant salmonid population studies are necessary to keep close track of the success of the few remaining native coho salmon.

Some locations where substrate data could confirm suspected aggradation include:

- Blair Gulch
- Barlow Gulch
- McGuire Creek
- Cavanaugh Gulch
- O'Connor Gulch
- Gulch 8
- Gulch 11
- Gulch 19
- Gulch 23
- Gulch 27

BUDGET

We will attempt to fund the highest priority actions as identified in this WMA to the extent funding constraints allow that, and will pursue additional funding to conduct outreach and enforcement activities on new developments of hillside vineyards is needed to pursue the actions we are currently unable to address.

Appendix 2.3.4-A

Partial listing of agencies and groups in the Ten Mile watershed with water quality jurisdiction and interests.

United States

- Environmental Protection Agency
- Fish and Wildlife Service
- National Marine Fisheries Service
- Natural Resources Conservation Service

California State

- California Environmental Protection Agency
- Department of Forestry and Fire Protection
- Board of Forestry
- Department of Fish and Game
- Department of Health Services
- Department of Toxic Substance Control
- Department of Water Resources
- California Coastal Conservancy

Mendocino County

- Water Agency
- Planning Department
- Department of Environmental Health

Local Agencies

- Mendocino County Resource Conservation District
- city planning departments
- city public works departments

Public Interest Groups and Industries

- Coast Action Group
- Pacific Coast Federation of Fishermen's Associations
- Georgia-Pacific Corporation
- Louisiana-Pacific Corporation
- Ten Mile River Watershed Association
- Campbell Group (Hawthorne Timber Company)

